REPORT RESUMES

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REPORT OF RESEARCH COORDINATION CONFERENCE ON AGRICULTURAL OCCUPATIONS (OHIO STATE UNIVERSITY, COLUMBUS, OHIO, MAY 27-29, 1963).

OHIO STATE UNIV., COLUMBUS, NAT.CTR.FOR RES.AG.ED.
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APPROXIMATELY 25 PERSONS FROM 14 STATES ATTENDED A CONFERENCE TO (1) MAXIMIZE THE POSSIBILITIES FOR ACHIEVING COMMONALITY IN AGRICULTURAL OCCUPATIONS STUDIES CONDUCTED BY STATES, (2) PROVIDE STATES WITH RESULTING MATERIALS AND ENCOURAGE STUDIES, AND (3) PROVIDE OPPORTUNITY FOR SHARING EXPERIENCES. A BRIEF APPRAISAL OF BASIC GENERAL CONSIDERATIONS AND GENERAL RESEARCH ON EDUCATION FOR AGRICULTURAL OCCUPATIONS EMPLOYMENT, BY G.Z. STEVENS, IS INCLUDED. COMMITTEE REPORTS ARE PRESENTED ON DEFINITIONS AND OBJECTIVES, IDENTIFYING THE POPULATION, SAMPLING PROCEDURES, INSTRUMENTS AND DATA COLLECTION, AND SUMMARIZATION AND IMPLEMENTATION. COPIES OF SURVEY FORMS USED FOR EMPLOYMENT OPPORTUNITIES STUDIES IN OHIO AND PENNSYLVANIA AND REVIEWS OF THREE STATE STUDIES COMPLETED OR UNDERWAY ARE ALSO INCLUDED. (RW)

ED018535

REPORT

of

RESEARCH COORDINATION CONFERENCE

on

AGRICULTURAL OCCUPATIONS

May 27, 28, 29, 1963

The Ohio State University
Columbus, Ohio

Sponsored by

The National Center for Advanced Study and Research
in Agricultural Education
The Ohio State University
Columbus, Ohio

and

The Agricultural Education Branch
Office of Education
Washington, D. C.

VT000461

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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PREFACE

Tremendous changes have taken place in the agricultural industry in recent years. A broad complex of businesses and services have evolved to facilitate the work of the production farmer and rancher. Agricultural educators and others are becoming increasingly aware that agriculture and farming are no longer synonymous.

It has also seemed evident that a broadened and extended program of vocational agriculture should play a vital role in providing needed agricultural instruction for certain workers in agricultural occupations. Additional information is needed to provide a valid means for projecting adjustments and extensions in vocational agriculture. Therefore, a number of states are planning extensive studies of employment opportunities and needed competencies in off-farm agricultural occupations. Dr. Nielsen, Specialist in Teacher Education and Research, Agricultural Education Branch, Office of Education, has worked with a number of states in initiating these research studies.

It became apparent that several benefits would accrue from a conference jointly sponsored by the National Center for Advanced Study and Research in Agricultural Education and the Agricultural Education Branch of the United States Office of Education to further develop and coordinate studies in this vital area. Accordingly, plans were developed early in the spring of 1963 for a three-day Research Coordination Conference to be held on the campus of The Ohio State University, May 27, 28, and 29. The broad purposes of this meeting were:

To maximize the possibilities for coordinating and achieving commonality in the agricultural occupations studies being conducted by the several states without violating the integrity of individual state studies;

To provide other states with resulting materials and encourage comparable studies;

To provide opportunity for individual states to benefit from the experiences of others in further developing and refining their proposal.

The following pages constitute a report of the committees' work during the conference. Time limitations did not permit the development of a "final" research proposal in this area. The committee reports, therefore, should be evaluated in terms of the framework in which they were produced. Furthermore, they should be looked upon as developmental and a suggested means of achieving some measure of coordination. States should adapt or add to these to fit their specific purposes. It is hoped, however, that each state will be able to retain as many as possible of the common elements identified in the various committee reports.

Finally, it was not possible to include in the report all of the ideas and suggestions that were presented. Participants presented many worthwhile materials and ideas which we were not able to include in this report. I sincerely hope that participating states will continue to share with the conference coordinators and their fellow participants materials that are developed incident to their individual state studies. Depending upon the completion of individual state projects, with a reasonable degree of coordination, a national summary of significance becomes attainable.

A word of thanks is due those states who granted permission to include their materials as appendices to this report.

I would like to express my thanks and appreciation to Dr. Duane M. Nielsen for his work as co-chairman and for reviewing these materials; also, to the conference participants for their cooperation and worthwhile contributions.

Robert E. Taylor
Director

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PARTICIPANTS

State	Name	Title
Alabama	H. W. Green	Subject Matter Specialist
Georgia	H. T. Lester	Teacher Educator
Kansas	Ray Agan	Head, Department of Agricultural Education
Kentucky	W. R. Bingham	Teacher Educator
	Harold Binkley	Teacher Educator
Michigan	Ray Clark	Teacher Educator
	Charles Langdon	Supervisor
Missouri	Warren Griffin	Graduate Assistant
New York	Joe Bail	Chairman, Division of Agricultural Education
	Everett Lattimer	Supervisor
North Carolina	Joe Clary	Supervisor
Ohio	Herbert Brum	Supervisor
	E. O. Bolender	Research Assistant
	Carleton Christian	Project Assistant
Pennsylvania	Norman Hoover	Teacher Educator
	Glenn Stevens	Teacher Educator
Tennessee	George Wiegers	Head, Department of Agricultural Education
	Otto Legg	Teacher Educator
Texas	Earl Webb	Teacher Educator
	Alton Ice	Executive Secretary, Vocational Agriculture Teachers Association
Washington	Robert Corless	Supervisor
West Virginia	Joseph Bailey	Supervisor

State	Name	Title
Other Participant	R. E. Geyer	Executive Secretary, Committee on Educational Policy in Agriculture, National Academy of Sciences

Coordinators: Duane M. Nielsen
Specialist, Teacher Education Research
Agricultural Education Branch
Office of Education

Robert E. Taylor
Director, National Center for Advanced Study and Research in Agricultural Education

AGENDA

Sunday, May 26

7:30 P.M.	Meeting of Committee Chairmen and Person Responsible for Review of Completed Studies

Monday, May 27

9:00- 9:10 A.M.	Introduction and Orientation --------- Robert E. Taylor
9:10- 9:40 A.M.	State and National Needs for Research in Agricultural Occupations --------- Duane M. Nielsen
9:40-10:00 A.M.	Conference Structure and Procedures ------------------------ Robert E. Taylor
10:00-10:15 A.M.	Break
10:15-11:00 A.M.	A Critical Review of Completed Studies ------------------ Glenn Z. Stevens
11:00-12:00 Noon	Presentation and Discussion by State Project Leaders of Studies Underway
12:00- 1:30 P.M.	Lunch
1:30- 3:00 P.M.	Presentations and Discussion of Tentative Project Outlines by State Leaders
3:00- 3:15 P.M.	Break
3:15- 5:00 P.M.	Presentations and Discussion of Tentative Project Outlines by State Leaders (Continued)
5:00- 7:00 P.M.	Dinner
7:00- 8:30 P.M.	Symposium, "Providing Optimum Coordination Among State Studies in Agricultural Occupations"

Committee A, Definitions and Objectives
  Chairman, Norman Hoover, Pennsylvania State University
Committee B, Identifying the Population
  Chairman, Ray Agan, Kansas State University
Committee C, Sampling Procedures
  Chairman, Joe Bail, Cornell University
Committee D, Instruments and Data Collection
  Chairman, Earl Webb, Texas A. & M. College
Committee E, Summarization and Implementation
  Chairman, Raymond Clark, Michigan State University

Group Interaction in Preparation for Committee Meetings

8:30- 9:30 P.M.	Committee Meetings

Tuesday, May 28

8:30- 8:45 A.M.	Group Meeting (Recapitulation)
8:45-10:30 A.M.	Committee Meetings
10:30-10:45 A.M.	Break
10:45-12:00 Noon	Progress Reports, Interaction, and Redirection
12:00- 1:30 P.M.	Lunch
1:30- 3:00 P.M.	Committee Meetings to Refine and Develop Recommendations
3:00- 3:15 P.M.	Break
3:15- 5:00 P.M.	Committee Meetings (Continued)
5:00 P.M.	Dinner

Wednesday, May 29

8:30- 8:40 A.M.	Group Meeting
8:40-10:00 A.M.	Committee Work
10:00-10:15 A.M.	Break
10:15-12:00 Noon	Final Committee Reports and Discussion
12:00- 1:30 P.M.	Lunch
1:30- 3:00 P.M.	Committee Reports (Continued)
3:00- 3:15 P.M.	Break
3:15- 4:00 P.M.	Coordination and Final Plans, Summary, Next Steps
4:00 P.M.	Adjourn

A BRIEF APPRAISAL OF BASIC GENERAL CONSIDERATIONS AND OF SIGNIFICANT RESEARCH ON THE EDUCATION OF PERSONS WHO ARE OR WILL BE EMPLOYED IN AGRICULTURAL OCCUPATIONS

Glenn Z. Stevens
The Pennsylvania State University

The work of this conference may be approached with a high degree of confidence in the long-range success of the coordinated research efforts about to be initiated. The importance of the task is becoming increasingly evident at all levels in our society. It is fortunate that we are not beginners in occupational education research because, were that so, it would be late to start. We know, and the nation is aware of, the effectiveness of agricultural education as it faced and met the needs of farmers. The Report of the Panel of Consultants on Vocational Education (13) urged support and coordination of research in a broadened program for farming and for a diversity of other occupations of rural and urban workers. As we design research on education for employment in business, industry, health and recreation involving agriculture, let us be reminded that the Report advised that a team approach be used among all branches of vocational education.

Every man who came to this meeting with an outline for research on agricultural occupations has already made something of a search of the literature. In the Illinois report, New Dimensions in Public School Education in Agriculture (11), Clark and Hemp have skillfully compared the major studies that probably influenced the plan and procedures you now propose to put into action in your state. Because they will be referred to in reports later today, we will defer individual mention and express only the high praise the project leaders deserve.

Krebs, James, Thompson, Phipps and Coster contributed ideas at the 1962 Illinois Conference that may be sources of hypotheses.

A word of caution at this point is that perhaps this week we should understand and act upon the logic of planning and testing comprehensive vocational education programs in schools of adequate size. We should consider the Hamlin (9) outline and discussion of who the groups of persons are that should be serviced by the various types of agricultural education. Employers cannot be expected to answer questions about needs for industrial and distributive education if the school in the community has only one vocational offering, that of a single teacher of agriculture.

Three Approaches to Research on Occupations

Many schools have had staff members who are trained in guidance for not longer than about ten years. According to Super (19, 20) it is only within this period that attention has been directed to a framework for research in vocational development. His work suggests three major kinds of research:

1. Trait and factor studies of individuals
2. Teaching experiments and pilot programs in schools
3. Economic-social surveys of employment needs of communities

Having for many years applied only the requirements of living on a farm, showing an interest in farming, and having facilities for a supervised practice program in enrolling boys in high school classes in vocational agriculture it is no wonder that progress in working cooperatively with the school's new guidance counselors has been fairly slow. The Summaries of Studies in Agricultural Education (17) have listed numerous descriptive reports on administrative practices in selecting students. Likewise, there have been many reports of follow-up surveys of jobs held by graduates. Most of the data are practically meaningless because the investigations have not involved a systematic search for relationships. The Iowa State project which included the Nielsen (12) thesis is a notable exception. Bundy, Drake and others are now starting a complementary series of studies directed to farm related occupations. Similar comparative - casual sampling surveys of relationships have characterized theses by Snyder (16) and Edington (6).

Trait and factor research has involved standardized testing. Great advances have been made since World War II. Teachers of agriculture, as a group, are highly competent in individual counseling but have not as yet taken initiative in helping guidance specialists to make maximum use of a testing program. The Pennsylvania Vocational Agriculture Interest Inventory (25) is about to become available for inclusion just prior to the ninth grade. The General Aptitude Test Battery (7) should be well understood by vocational educators as they cooperate with the Bureau of Employment Security in vocational retraining and placement.

The April, 1963, issue of Review of Educational Research (14) is devoted entirely to guidance, counseling, and personnel services. No where else can so many current references to theoretical constructs for occupations research be found in classified form.

Discussion of the second approach, that of teaching experiments and pilot programs, may begin with a reference to current recommendations that vocational funds be used for these activities. Studies in California, North Carolina, Illinois, Michigan, Wisconsin and Pennsylvania are in progress or recently completed. They will improve units of instruction now being taught in vocational agriculture with special application to students who will work in non-farming jobs.

The Cooperative Research program, Office of Education, recently has approved a teaching experiment (15) that will compare a job-oriented technician level curriculum in tool design with a field-oriented curriculum in mechanical technology. The students will be men eligible for Manpower Training. Outcomes will be job placement and success. In at least three states pilot programs of agricultural business training in cooperation with distributive education are in progress. More should be started. Agricultural Experiment Station projects in programmed learning are in operation at Cornell, Minnesota and Penn State. Large experiments, in twenty-four and twenty-seven schools, on teaching units in occupations and in biological science principles are being brought to completion in Pennsylvania this month.

It is research of the third type that most of you have come here to design. The investigations are economic-social surveys of employment needs in rural communities. The data schedules for use by interviewers are patterned after those used in California (18, 23), New York (24), Washington (3), Michigan (4), and North Carolina (2). Each of these important studies has contributed a classification of agricultural occupations and a sampling procedure. They have not gone far enough in producing new course outlines and administrative procedures for getting appropriate training under way.

Controls Needed for Multivariate Analysis

It has been said that a study well designed is three-fourths done. Put another way, the tables for the data and the statistical analysis procedures to be employed must be prepared and chosen before going to the field to conduct the research. We must no longer be satisfied with the "law of the single variable." The 1962 edition of Good, Introduction to Educational Research (8), has discarded finally the single variable approach and forthrightly recommended that efficient research involves simultaneous investigation of several controls (independent variables). Selection of the factors depends upon the creativity and imagination of the team of investigators and project advisers.

Courtney (5) at Purdue in 1962 used an analysis of variance model in discovering differences in job functions among three selected agricultural occupations. While the report overemphasizes the statistical procedures the design is worth serious consideration. We are only beginning to see the possibilities in covariance analysis as an efficient tool in controlling sources of variability which, if ignored, may obscure relationships that actually exist.

Team Effort Needed in Reporting Research

We have assembled in the hope that not only will we return to conduct individual state studies that will have greater promise of usefulness in adjusting future programs but also expecting that a coordinated body of new information will be published in an integrated manner. The new National Center for Advanced Study and Research, the Agricultural Education Branch of the Office of Education and the Regional Research Committees of the American Vocational Association are pledged to full support of the outcomes of this conference. You may count upon all three for consulting service in terms of the unique needs in each state.

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SUGGESTED USE OF MATERIALS

The following committee reports should be viewed as a resource, as reference materials for states and their sub-divisions contemplating studies in the agricultural occupations area. It is hoped that many states will conduct studies in this area as a means of determining how vocational agriculture might best serve present and prospective workers in agricultural occupations.

One of the hoped-for outcomes of these studies is regional and/or national summaries. It is recognized that of necessity there will need to be individual state variations, however, coordination and summarization will be facilitated to the degree that states can successfully incorporate as a part of their minimal effort the suggestions contained in the committee reports, particularly with reference to the suggested items included in the interview schedules.

States contemplating agricultural occupations studies will find the bibliographies on pages 6-7, 25-26 helpful. The instruments of state studies underway included in the appendices should also provide many worthwhile suggestions.

When conducting these studies it is requested that states forward copies of their materials to the Director of the National Center and to the Specialist for Teacher Education and Research in the Office of Education. When individual projects are completed, it is suggested that summaries of state studies be sent to the aforementioned offices for use in national summarization. It is contemplated that a national task force will be assembled at the Center to review these data, prepare summaries, assist in developing guidelines for curricula, and suggest experimental or pilot programs. States are encouraged to work closely with other vocational education services and other educational agencies in developing, conducting, and interpreting their studies.

Committee A

DEFINITIONS AND OBJECTIVES

Norman Hoover - Chairman
Charles Langdon - Secretary
Joe Clary
Herbert Brum

DEFINITIONS AND OBJECTIVES

It was the concern of the committee that the objectives for the various state studies of agricultural occupations, other than farming and ranching, should be based on the emerging objectives of programs of vocational education in agriculture. In the opinion of the committee the major emerging program objectives are as follows:

1. To provide vocational education in agriculture for those planning to engage in or already engaged in careers in farming and ranching;
2. To provide vocational education in agriculture for those planning or engaged in other agricultural occupations who can benefit from such vocational and technical education, of less than a baccalaureate degree;
3. To provide basic vocational education in agriculture for those who plan careers in fields of agriculture requiring a baccalaureate degree.

The state studies should provide data which will support, alter, or further clarify these major emerging program objectives.

The state studies under consideration are directed primarily to emerging objectives numbered 2 and 3 above. The exclusion of farming and ranching (objective 1) from the studies is not intended to minimize the importance of this phase of vocational education in agriculture. More evidence for programming is available in this area than in the other areas of agricultural occupations.

Consequently, the primary intent of the state studies should be to analyze this additional segment of our agricultural economy, not now adequately served by vocational and technical education, and about which sufficient knowledge for program development is not available.

It should not be the intent of such studies to "stake out a claim" for any program or segment of vocational and technical education, but rather to identify existing and emerging vocational and technical agricultural education needs. After the data are available, judgment should be made relative to program expansion and adjustments, the development of new programs or program combinations of various types and levels which will most effectively meet the identified needs.

Therefore, the committee recommends that the following should be the basic objectives of these state studies:

1. To identify present and emerging agricultural occupations, other than farming and ranching, for which vocational and technical agricultural education should be available;
2. To determine present and anticipated numbers of employees in these occupations;
3. To estimate the annual entry opportunities in these occupations;
4. To determine competencies needed for entry and satisfactory performance in these occupations;
5. To determine other characteristics of these occupations such as salary, minimum age for entry, union restrictions, labor laws, required experience, formal education;

6. To determine continuing education needs of those employed in these occupations.

The attainment of these objectives in the state studies should result in the subsequent achievement of the anticipated outcomes listed below:

1. Job descriptions;
2. Job clusters by training categories;
3. Course outlines and curricula;
4. Experimental programs designed to establish administratively feasible ways of offering the curricula to meet the identified needs under varying conditions;
5. Adjustments in current programs.

These outcomes are considered an integral part of this research and specific provisions should be made to assure their achievement. They should be the product of a cooperative effort involving appropriate segments of vocational education, other educators, and the agricultural industry.

The committee suggests the following definition of the term "agricultural occupation:"

> An agricultural occupation is one in which the worker needs competencies in one or more of the primary areas of plant science, animal science, soil science, farm management, and agricultural mechanization.

Committee B

IDENTIFYING THE POPULATION

Ray Agan - Chairman
W. R. Bingham - Secretary
Everett Lattimer
E. O. Bolender
Otto Legg

IDENTIFYING THE POPULATION

This committee worked on the premise that a need exists for determining the job opportunities in agriculture other than farming and ranching, which, when properly identified, classified, and clustered, should serve as a basis for adjustment and extension of agricultural education programs. Because of recent trends in thinking by leaders in the field of vocational agriculture and others, the sensed need for determining such job opportunities has become more urgent. In order to study off-farm job opportunities in agriculture, procedures must be developed and research techniques identified from which judgments may be secured on abilities needed to make potential employees and personnel more effective agricultural workers.

The purpose of Committee B, Identifying the Population, is to suggest or identify those businesses, organizations, and/or agencies to be surveyed in reaching the objectives set forth by Committee A, Definitions and Objectives.

Within business, industry, and the several agencies and organizations providing services to agriculture a number of people use agricultural competencies in their regular employment. A study of agricultural occupations should identify those competencies needed for the successful performance of these agricultural aspects of certain jobs. These occupations will represent a broad range of ability levels and, also, have a similarly broad range in the degree to which the job may be agricultural.

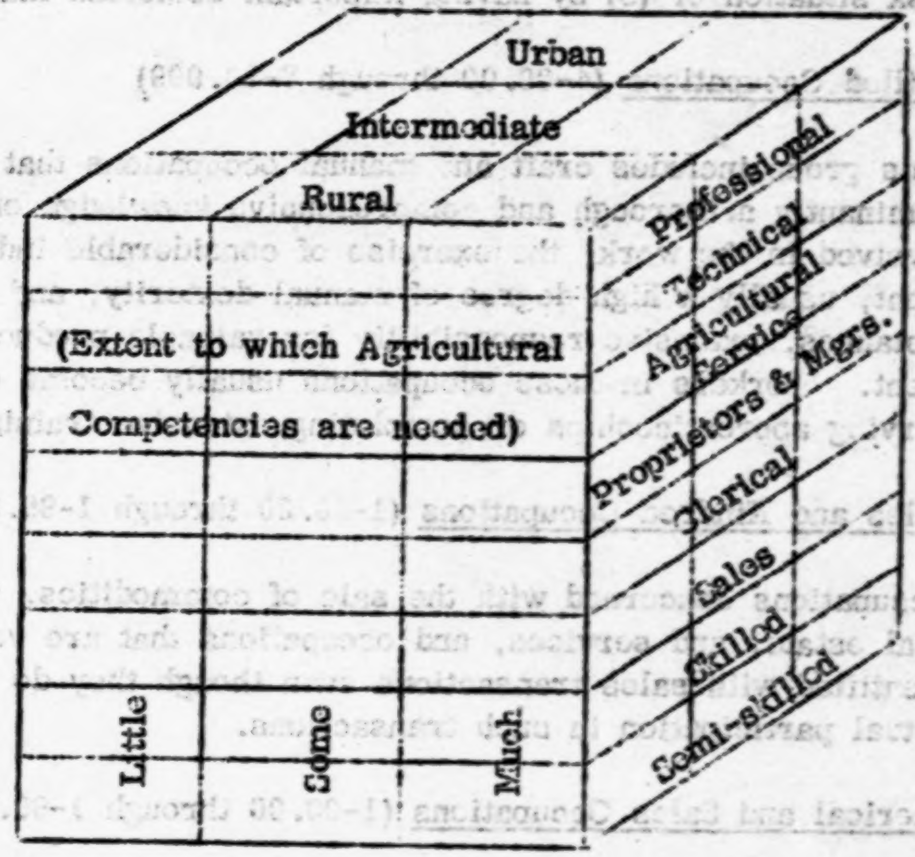
As previously stated in the report of Committee A, it is assumed that programs in vocational agriculture may expect to have a broadened base. It is also assumed that curriculum adjustments will be made to provide training needed. Some of the curriculum changes may integrate parts of business education, distributive education, and trade and technical education with that of vocational agriculture.

Development of programs of training and retraining may include thirteenth and fourteenth year instruction. Other avenues may include a two-year basic program of vocational agriculture followed by special training curricula; the regular four-year program in vocational agriculture followed by a two-year supplemental special training program and area schools may offer programs providing opportunity for both specialization and higher levels of training.

Two types of populations for study were considered by the committee--one, a population identified as workers, graduates, and other personnel without regard for the businesses in which they work; the other, a population of the businesses which relate to farming and employ workers. It was the decision of this committee to concentrate upon the latter type of population.

A study of research projects underway by the various states revealed two general plans of selecting a population of businesses, agencies, and organizations for study. One plan includes all businesses, agencies, and organizations within a described area without regard to their purpose, the other plan limits the population to those businesses, agencies, and organizations whose personnel use agricultural abilities in the performance of their duties. Figure 1 shows the committee's concept of the latter plan, including various stratifications.

Figure 1: Agricultural Occupations Population Complex


Urban
Intermediate
Rural
Professional
Technical
Agricultural Service
Proprietors & Mgrs.
Clerical
Sales
Skilled
Semi-skilled
(Extent to which Agricultural
Competencies are needed)
Little
Some
Much

The population could further be stratified by including only:

1. The population of a region (administrative rather than geographic);
2. The population in a community stratified by size.

The stratification of the population from the service level to the professional level was defined by the committee from a study of the Dictionary of Occupational Titles, Volume III, "Occupational Classification, USDL," and other sources as follows:

1. Semi-skilled Occupations (6-00.00 through 7-99.999)

   This group includes manual occupations that are characterized by one, or a combination of parts, of the following requirements: The exercise of manipulative ability of a high order, but limited to a fairly well-defined work routine; major reliance, not so much upon the worker's judgment or dexterity, but upon vigilance and alertness in situations in which lapse in performance would cause extensive damage to product or equipment; and the exercise of independent judgment to meet variables in the work situation, which is not based on wide knowledge of a work field and with the nature and extent of the judgments limited either (a) by application over a relatively narrow task situation or (b) by having important decisions made by others.

2. Skilled Occupations (4-00.00 through 5-99.999)

   This group includes craft and manual occupations that require predominantly a thorough and comprehensive knowledge of processes involved in the work, the exercise of considerable independent judgment, usually a high degree of manual dexterity, and in some instances, extensive responsibility for valuable product or equipment. Workers in these occupations usually become qualified by serving apprenticeships or completing extensive training periods.

3. Sales and Kindred Occupations (1-50.00 through 1-99.99)

   Occupations concerned with the sale of commodities, investments, real estate, and services, and occupations that are very closely identified with sales transactions even though they do not involve actual participation in such transactions.

4. Clerical and Sales Occupations (1-00.00 through 1-99.99)

   Occupations concerned with the preparation, transcribing, transferring, systematizing, or preserving of written communications and records in offices, shops, and other places of work where such functions are performed.

5. Managerial and Official Occupations (0-70.00 through 0-99.99)

   Occupations that are involved primarily with responsible policy-making, planning, supervising, coordinating, or guiding the work-activity of others, usually through intermediate supervisors.

6. Agricultural Service Occupations

   Occupations concerned with providing professional and semi-professional services largely protective in nature, in the public interest--inspection, regulative, quarantine, grading, and serving.

7. Technical (Technician)

   Occupations concerned with many levels of skills and a wide variety of training requirements. Occupations where one performs specific tasks which are functional parts of scientific activities requiring knowledge of fundamental theory and requiring highly developed skills.

8. Professional Occupations (0-00.00 through 0-39.99)

This group includes occupations that predominantly require a high degree of mental activity by the worker and are concerned with theoretical or practical aspects of complex fields in human endeavor. Such occupations require for the proper performance of the work either extensive and comprehensive academic background, or a combination of such education and experience.

The committee considered a further possible startification of population consisting of those businesses, agencies, and organizations whose personnel use agricultural abilities in the performance of their duties as:

1. One step from the farm (giving service, buying, or selling directly to the farmer; i.e., buyer of apples)
2. More than one step from the farm (not dealing directly with the farmer; i.e., sorter or packer of apples)

The committee also considered the sources of listings for the businesses, agencies, and organizations to be included in the population for a given state or region. A study of the research projects presented and reviewed by this conference (see bibliography) revealed the following sources used:

1. Telephone directories (yellow pages)
2. Sales tax rolls
3. Government agencies (such as)
    a. State Board of Agriculture
    b. Soil Conservation Service
    c. Pure Food and Drug Administration
    d. State Civil Service job titles and rolls
4. Business analysts and advertisers
5. Directories of business organizations

6. Department of Commerce, Industrial Development Commission, Employment Security, and other similar lists

The committee recommended that any state undertaking a study of agricultural occupations give due consideration to the selection of a population which not only meets their own needs as they envision them, but also one which gives as much continuity as possible to the nationwide effort by the collective states. Inclusion of at least those businesses, agencies, and organizations which sell to, give service to, or buy from farmers directly is desirable plus any expansion of this basic population as needed to meet local or state needs.

Examples of those businesses, agencies, and organizations which buy from farmers would include--poultry and produce firms, livestock buying firms, dairies, sales barns, food processors, and packers.

Examples of those businesses, agencies, and organizations which sell to farmers would include--feed stores, grain stores, seed stores, fertilizer stores, farm supply and implement stores, nurseries, agricultural chemical stores, and farm fuel suppliers.

Examples of those businesses, agencies, and organizations which give agricultural service to farmers would include--Soil Conservation Service, banks, animal disease eradication office, plant pest control office, Federal Crop Insurance Corporation, forest service, statistical reporting service, and feed processors.

Examples of other businesses, agencies, and organizations worthy of consideration for inclusion in the population would include--florists, garden center employees, and employees in forestry, game management, turf management, greenhouse, recreational park area, and ornamental horticulture.

BIBLIOGRAPHY OF STUDIES IN PROGRESS

The following bibliography is made up of various studies concerned with agricultural occupations other than farming. Most of these studies are in the tentative or early stages. The people listed may be able to give help in determining the population for a study. The names listed are for contact purposes and not necessarily the ones conducting the studies.

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Brum, H. D. "A Study of Off-farm Agricultural Opportunities and Training Needs in Ohio." Columbus, Ohio: Division of Vocational Education, State Department of Education.

Bundy, C. E. "Factors Related to the Occupations of Iowa Male Farm-reared High School Graduates." Ames, Iowa: Iowa State University.

Griffin, Warren. "Agricultural Occupational Survey of Marshall, Missouri." Columbia, Missouri: University of Missouri.

Griffith, John W. "The Number and Kind of Agri-business Jobs Available for a Two-year Graduate in Agriculture from a Junior College." Yakima, Washington: Yakima Valley College.

Hoover, Norman. "Pre-employment and In-service Educational Needs of Persons Engaged in Off-farm Agricultural Occupations in Selected Geographical Areas of Pennsylvania." University Park, Pennsylvania: Department of Agricultural Education, The Pennsylvania State University.

Langdon, Charles. "A Survey of Opportunities for Youth in Agriculture in Michigan." Lansing, Michigan: State Department of Education.

Phipps, Lloyd J. "Technical Education in and for Rural Areas." Urbana, Illinois: Department of Agricultural Education, University of Illinois.

Shontz, David F. "A Teaching Experiment in Agricultural Occupations Information." University Park, Pennsylvania: Department of Agricultural Education, The Pennsylvania State University.

Committee C

SAMPLING PROCEDURES

Joe Bail - Chairman
H. T. Lester - Secretary
Harold Binkley
Robert Corless

SAMPLING PROCEDURES

On the state level - by interview

1. Stratify interview units by total population of the geographic area within the state.

   Suggested strata:

   a. 100,000 +
   b. 50 - 99,999
   c. 25 - 49,999
   d. 10 - 24,999
   e. 2,500 - 9,999
   f. Less than 2,500

   These may be cities, towns, villages, or whatever geographic or economic area which seems appropriate.

2. Select the sample by random and/or systematic selection from a list. For information on occupations in state or federal governmental agencies, contact the agency directly. (State or federal headquarters.) A 7 - 8 percent sample of units within the population is suggested (every twelfth name).

On the state level - by mailed questionnaire

1. Same as above

2. Same as above, except the sample should be approaching 16 percent (every sixth name) of the units within the population.

On a local level, under 10,000 people - by interview

1. Secure a complete list of businesses, industries, agencies, and organizations.

2. Interview all and/or if in a large area, take a random sample, perhaps as high as 25 percent.

On a local level - by mailed questionnaire

1. Same as above

2. Contact all

Cautions:

1. Check carefully for duplications in the population or in the samples drawn.

2. If alphabetical lists are used, be aware of the frequency of listings under A - Agriculture, F - Farm, etc.

3. Time, cost, and other factors will be the major points to consider in sampling.

4. The major criteria to observe in sampling are:

   a. Removal of bias.

   b. Consistent with time, costs, etc., and yet provide as much information as possible about the total population.

Committee D

INSTRUMENTS AND DATA COLLECTION

Earl Webb - Chairman
Warren Griffin - Secretary
Carleton Christian
George Wiegers

INSTRUMENTS AND DATA COLLECTION

The major purpose of Committee D was to develop basic suggestive instruments to be used in collecting data for studies designed to determine the number and nature of agricultural occupations, other than farming or ranching, which exist in the various businesses, industries, organizations and institutions throughout the Nation. Inherent in the purpose was a desire to identify certain basic items which should be included in all studies to provide an opportunity to compare occupational information between studies and across state lines.

The first effort of the committee was to review similar work done or being planned in the various states with particular reference to stated objectives and instruments. Naturally, rather wide variations were observed but they seemed to contain a great deal of commonality. The major differences were in procedures and the specificity of occupational information being obtained.

The second task was to establish tentative working objectives which were rather specific. The decision was to construct an instrument within the framework of our tentative purposes - which, it was believed, would necessitate an analysis of jobs. Thus, the task of developing items was undertaken which would obtain the desired data. It was decided that certain basic data were needed about the employer that would not necessarily be needed in an analysis of each job. Therefore, Form 1 was developed to be used in making various determinations about the employer being surveyed and to explore for agricultural occupations. The second form, Form 2, was believed to be needed to provide information about specific occupations.

After the final report of Committee A, Definitions and Objectives, it was necessary that the committee revise work previously done by adding, deleting and changing. Each item was carefully evaluated in light of stated or implied objectives. It was not the intent of the committee to construct and recommend instruments for blanket use by investigators. It was the intent, however, that they be used as a reference to determine the commonalities that should be included in instruments for investigating the nature and extent of agricultural occupations, other than farming or ranching. Consequently, it is suggested that the items shown in Committee Forms 1 and 2 be considered as minimum and, whenever possible, be included as classified in studies so these items may be summarized across state lines.

Possible Uses and Committee Recommendations

It was the opinion of the committee that occupational information which could be used in adjusting curricula to current and future needs could be collected best through the interview technique. Therefore, no attempt was made to develop a questionnaire that could be mailed; however, the possibility was, by no means, considered to be impractical.

Two forms are recommended if the interview technique is used. Much general data are needed about the employer which can be consolidated conveniently on one form. It would be impractical to repeat all general data as each job is analyzed; Form 2 is to be used to collect data about a specific job. One Form 2 is to be completed for each job title existing in the employers establishment.

No attempt was made to code either form for machine processing. However, it is recommended that investigators seek professional assistance available on most university campuses in coding each item. It will be impossible to code all items but provisions should be made for inserting a code on the applicable item after data are collected and grouped according to some relationship. For example, there may be enough similarity between certain labor union requirements that all can be placed into three or four categories which will be easy to code if space is previously provided on the form. It is important that Forms 1 and 2 be coded together.

Furthermore, the committee recommends that a manual be developed for use by interviewers; otherwise, the data would have little meaning due to variations in interpretations. This should be on an item by item basis, no item should be left to private or personal interpretation.

Also, the committee recommends that data collecting instruments being used in Ohio, Pennsylvania, and Illinois be included as a part of this report. These are representative of the kinds being used by various investigators. Other instruments may be included if the Conference Secretary has them available and believes they will contribute to the effectiveness of the development of occupational studies.

Employment Opportunities and Needed Competencies
in
Agricultural Occupations

Form 1

____________________ (Code) ______ Interviewer Date ____________________

I. Company, firm, organization, or agency

A. Name of firm, agency, etc. ____________________ Code ____________

B. Address ____

C. Name of person interviewed ________________________________

Telephone Number ____________________

Position of person being interviewed

_____ 1. Owner

_____ 2. Owner - manager

_____ 3. Manager (hired)

_____ 4. Personnel director

_____ 5. Sales manager

_____ 6. Office manager

_____ 7. Supervisor (dist., area, etc.)

_____ 8. Other

D. Main function of firm, organization, or agency

_____ 1. Sales

_____ 2. Service

_____ 3. Purchasing

_____ 4. Manufacturing

_____ 5. Processing

_____ 6. Wholesaling

_____ 7. Other

E. Major products, service, etc. (specific)

____

____

____

F. Type of business

_________% of gross income agriculturally oriented

G. Years in business ______________

II. Employees

A. Total number (including owners) ____________

B. Present job titles

Title	Number of Employees	Level of Employment (See Code)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

C. What new job titles are foreseen in this firm in the next five years?

Title	Number of Employees	Level of Employment (See Code)
1.		
2.		
3.		
4.		

Level Code

1. Professional
2. Technical
3. Proprietors and managers
4. Sales
5. Clerical
6. Skilled
7. Semi-skilled
8. Service (unskilled)

Employment Opportunities and Needed Competencies
in
Agricultural Occupations

Form 2

Date____________________

Interviewer____________________ Firm Code__________ (same as Form 1)

Job Title____________________ Code____________________

Alternative Titles____

____

I. Characteristics

A. Total number of employees __________

1. Number of full-time employees __________

2. Number of part-time employees __________ No. months (ave.)______

B. Number of employees needing supplemental training

1. Number of full-time employees __________

2. Number of part-time employees __________

C. Level of employment ____________________ (See code)

Level Code

1. Professional	5. Clerical
2. Technical	6. Skilled
3. Proprietors and managers	7. Semi-skilled
4. Sales	8. Service (unskilled)

D. Monthly salary

Full-time Employees		Part-time Employees
__________ 1. Start	(Convert to monthly if paid by week)	__________ 1. Start
__________ 2. Top		__________ 2. Top

E. Outlook for employment

1. Number employed last year __________

2. Anticipated number to be employed next year __________

3. Anticipated number to be employed in 19___ (five years from date) _____

4. Average annual turnover (employment opportunities) ______________

II. Requirements for entering the occupation

A. Residential background

________ 1. Farm background

________ 2. Rural, non-farm background

________ 3. Urban background

________ 4. No preference

B. Minimum formal education

________ 1. High school

________ 2. Post high school or technical school

________ 3. B.S. degree

________ 4. M.S. degree

________ 5. Ph.D. degree

________ 6. Doesn't matter

C. Age

________ 1. Minimum

________ 2. Maximum

D. Labor union requirements

____

____

E. Labor laws

F. Work experience required

G. Licensing or certification

H. Other (specify)

III. Activities and duties of job title (job analysis)

(List those major activities and duties that are performed in this job. What does a person in this job do?)

A.

B.

C.

D.

E.

IV. Agricultural enterprises associated with job title

(Which agricultural enterprises are most nearly associated with this job title?)

____ 1. Beef Cattle, ____ 2. Dairy Cattle, ____ 3. Swine, ____ 4. Sheep,

____ 5. Goats, ____ 6. Horses, ____ 7. Poultry, ____ 8. Corn,

____ 9. Cotton, ____ 10. Soybeans, ____ 11. Wheat, ____ 12. Vegetables,

____ 13. Citrus, ____ 14. Tobacco, ____ 15. Barley, ____ 16. Oats,

____ 17. Rye, ____ 18. Sorghums, ____ 19. Grasses, ____ 20. Alfalfa and Sweet Clover, ____ 21. Clovers, ____ 22. Flax, ____ 23. Rice,

____ 24. Berries, ____ 25. Soils, ____ 26. Timber, ____ 27. Fruits,

____ 28. Other (list other enterprises appropriate to the area)

V. Competencies associated with job title

(To what degree are the following competency areas needed for successfully fulfilling this job title?)

Code: 1. Essential 2. Highly desirable 3. Useful 4. Unnecessary

A. Agricultural competencies

1. Plant Science

____ a. Plant breeding

____ b. Soils and fertilization

____ c. Controlling insects, diseases, and weeds

____ d. Conservation of natural resources

____ e. Harvesting, storing, marketing, and processing

____ f. Other production practices (specify) ____________

____ g. Other (list)

2. Animal Science
    _____ a. Selection and breeding
    _____ b. Nutrition and feeding
    _____ c. Health and sanitation
    _____ d. Housing and equipment
    _____ e. Marketing and processing
    _____ f. Other production practices (specify) ____________________
    _____ g. Other (list)

3. Agricultural business management and marketing
    _____ a. Budgeting, records, and analysis
    _____ b. Farm financing (credit, insurance)
    _____ c. Farm layout
    _____ d. Labor management
    _____ e. Marketing practices and research
    _____ f. Agricultural policy
    _____ g. Other (list)

4. Agricultural mechanization
    _____ a. Farm power and machinery
    _____ b. Farm buildings and conveniences
    _____ c. Rural electrification
    _____ d. Soil and water management
    _____ e. Agricultural construction and maintenance
    _____ f. Other (list)

B. Supporting competencies

_____ 1. Salesmanship

_____ 2. Customer relations

_____ 3. Accounting

_____ 4. Communications

_____ 5. Office procedures

_____ 6. Bookkeeping

_____ 7. Buying and selling

_____ 8. Displaying and packaging

_____ 9. Advertising

_____ 10. Government regulations (taxes, etc.)

_____ 11. Supervisory and management training

_____ 12. Market analysis

_____ 13. Electronics

_____ 14. Auto mechanics

_____ 15. Mechanical drafting and design

_____ 16. Sheet metal work

_____ 17. Building trades

_____ 18. Industrial chemistry

_____ 19. Transportation

_____ 20. Other (specify)

Committee E

SUMMARIZATION AND IMPLEMENTATION

Raymond Clark - Chairman
Alton Ice - Secretary
H. W. Green
Joseph Bailey

SUMMARIZATION AND IMPLEMENTATION

Summarization

1. State level

   a. Summarize, using minimums suggested by the conference.

   b. Involve representatives of appropriate segments of vocational education, other educators, and the agricultural industry in interpreting data.

   c. Furnish data for national summarization. It is suggested that individual states forward to the National Center and the Office of Education data comparable to that elicited by Forms 1 and 2, Committee Report D, pages 37-44.

2. National level

   a. Summarize data across state lines.

   b. Involve representatives of appropriate segments of vocational education, other educators, and the agricultural industry in interpreting data.

   c. Develop course outlines and patterns for experimental programs to establish feasible administrative procedures.

   d. Recommend adjustments in current programs.

   e. The committee recommends that this national work be done at the National Study Center by professional vocational educators.

Implementation

1. Develop guidelines for use in developing and adjusting programs.

   a. Use in experimental schools.
   b. Refine and offer as suggestions to other schools.

2. Establish experimental programs.
   - a. Identify schools.
   - b. Develop working agreements and financial arrangements.
   - c. Evaluate.

3. Introduce training programs.
   - a. In local schools
   - b. In area schools
   - c. Analyze present programs and adjust to new needs.
   - d. Add teachers where needed to meet needs.

4. Make necessary adjustments in teacher training and supervision programs.
   - a. Pre-service
   - b. In-service
   - c. Instructional materials
   - d. Research and evaluation

5. Publicize findings and programs.
   - a. Results of research
   - b. Follow-up of trainees
   - c. Provide popularized information on agricultural occupations.

6. Involve people outside vocational agriculture.
   - a. State school officers
   - b. Local and intermediate school administrators
     - (1) Conferences
     - (2) Visits to experimental program or reports from experimental programs
   - c. Other vocational educators
   - d. Advisory councils (broad membership)

APPENDICES

PROJECT REPORT

TITLE: **TECHNICAL EDUCATION IN AND FOR RURAL AREAS**

CONDUCTED BY: **The Staff of the DIVISION OF AGRICULTURAL EDUCATION, Department of Vocational, Technical and Practical Arts Education, University of Illinois, Urbana**

PERSONNEL INCLUDE:
Lloyd J. Phipps, Professor and Chairman, Agricultural Education Division, Director
Paul E. Hemp, Associate Professor, Agricultural Education
A. H. Krebs, Associate Professor, Agricultural Education
J. R. Warmbrod, Assistant Professor, Agricultural Education
Gerald R. Fuller, Instructor, Agricultural Education
Roy D. Dillon, Graduate Assistant
Harvey A. Carley, Graduate Assistant
Keith E. Fiscus, Graduate Assistant
Kenney E. Gray, Graduate Assistant
Glenn W. Hayes, Graduate Assistant
Dwight W. Heckert, Graduate Assistant

Purposes of the study: the following purposes encompass the long range plans for the study as well as the phase of the study being reported on at this time:

1. To identify present and emerging technical occupations in representative rural areas and in representative industries that serve rural areas.

2. To determine what technical occupations, if any, are especially suitable for persons with rural backgrounds and educational experiences.

3. To determine the employment opportunities for the occupations identified.

4. To determine competencies required for a selected number of these occupations.

5. To determine educational programs needed for these technical occupations.

6. To determine procedures for implementing the development of the educational programs needed for these technical occupations.

7. To establish and evaluate pilot educational programs for the occupations identified.

What data now being gathered will tell us: the data being obtained in this first phase of the study will provide the following information for the area being studied.

1. The kinds of businesses in the area.

2. The number of businesses in the area.

3. The functions of each business.

4. The kinds of jobs or positions in each business.

5. The number of persons employed in each job or position.

6. The activities and duties for each job or position.

7. The areas of information or knowledge with which workers in each job or position must be familiar.

8. The prerequisites for each job or position.

9. The employment opportunities for each job or position.

Area being studied: Although long range plans anticipate the study of the entire State of Illinois, practical limitations indicate that a smaller area should be used as a starting place. It was decided to take advantage of the study, "Vocational and Technical Education in Illinois"[1], by selecting one of the areas identified in that study as containing a population large enough to support a technical education program. The area finally selected was Area VII.

Businesses being studied: The businesses to be studied in the area chosen were selected by use of a multi-stage cluster sampling technique with two way stratification, using a table of random numbers for actual drawing of samples. The steps taken in securing the sample were as follows:

1. The names of all telephone exchanges in the area were obtained from the Illinois Commerce Commission.

2. The telephone exchanges were stratified according to the population of the largest town in each exchange and a total sample of 44 exchanges was drawn as follows:

Population Category	Number of Exchanges in Category	Number of Exchanges in Sample
0 - 1,000	123	32
1,000 - 2,500	37	7
2,500 - 5,000	12	2
5,000 - 10,000	3	1
10,000 - 25,000	4	1
25,000 - 50,000	4	1

The exchanges included in the sample were:

Cornell
St. Anne
Beaverville
Kempton
Chenoa
Piper City
Danforth
Watseka
Cropsey
Colfax

Saybrook
Downs
Stanford
Atlanta
Le Roy
Rantoul
Potomac
Henning
Alvin
Danville

Ivesdale
LaPlace
Villa Grove
Broadlands
Indianaola
Georgetown
Hume
Arthur
Findlay
Westervelt

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[1] Vocational and Technical Education in Illinois by McLure, Mann, Hamlin, Karnes, and Miller, Bureau of Research, College of Education, University of Illinois, for the Office of Superintendent of Public Instruction, Illinois. 1960

Towanda
El Paso
Stockland
Wellington
East Lynn
Flatville
Mansfield
Fithian
Westville
Windsor
Annapolis
Gila
Montrose
Stewardson

3. The telephone books for the exchanges in the sample were secured and a list of the businesses compiled.

4. A sample of the businesses was drawn. A total of 428 businesses were drawn by random for interviewing.

Instruments developed: Three forms were developed for gathering the data. These forms are attached to this report as Items A, B, and C. These forms provide for gathering data about the company and jobs as indicated earlier in this report. Data are recorded on the instruments both in the form of check-list items and in the form of clarifying remarks. Item C is a summary description of the job by the interviewer. This step is provided for to assure that the full value of the interviewers observations will be obtained. Item A is for securing information about the entire business; Item B is for securing information about the specific jobs or positions.

Training the interviewers: Considerable effort was made to prepare properly the interviewers for their task. The steps followed in the training program were:

1. Orientation of interviewers regarding the best methods for contacting businesses and conducting the interviews based on the prior experience of the staff.

2. Presentation and discussion of the instruments.

3. Role playing the interview situation.

4. Role playing and tape recording the interview situation and subsequent play-back and evaluation of the interview.

5. Actual conduct of interviews by the interviewers with subsequent evaluation of their reports. The interviewers were sent out in pairs and each interviewer observed and conducted an interview with each of the other interviewers. The Champaign-Urbana area was used for the first interviews, since this area did not fall in the sample.

An "Interviewers' Manual" was prepared by L. J. Phipps for the use of the interviewers in preparing for their task. A copy may be secured by writing the author at the Department of Agricultural Education, University of Illinois, Urbana, Illinois.

Statistical analysis: The use of the multi-stage cluster sampling technique will permit the projection of the results to the universe for the study, Region VII of the study, Vocational and Technical Education in Illinois. Statistical confidence levels for these projections will be determined.

The forms are organized for tabulation of data on IBM cards to facilitate statistical treatment and data summarization.

When the projected phases of the study are completed, in 1963-64, statistical analysis relating to significant differences between areas and businesses will be determined.

A

___ Interviewer Identification Code

___	___	___	___	___	___
1-D	2-4TE	5-PS	6-TB	7-AC	8-10F

Date__________

TECHNICAL EDUCATION IN AND FOR RURAL AREAS STUDY AGRICULTURAL EDUCATION DIVISION, UNIVERSITY OF ILLINOIS

Form 1

I Name of Company or Firm______________________________

____

II Address______________________________

Names of Persons Contacted__________________ Tele__________

__________________________________ Tele__________

___11 IV Position in Company of Person Interviewed 1. Owner 2. Owner-manager 3. Manager-hired 4. Personnel director 5. Sales manager 6. Office manager 7. Other (specify)__________________

V Functions of Company

___12 Manufacturing
___13 Purchasing
___14 Service
___15 Constructing
___16 Retailing
___17 Warehouse
___18 Processing
___19 Wholesaling
___20 Contractor
___21 Other (specify)_______

VI Products, Services or Functions of Company

____
____
____
____
____

VII Type of Business

_ _ _22-24 Percentage of business agricultural oriented

_ _ _25-27 Percentage of business non-agricultural

VIII

_ _ _28-30 Total number of workers (Owners and employees)

IX Job Titles and Number of Workers in Each

B

____ Interviewer Identification Code ___ ____ ____ ____ ____ ____ ____
1-D 2-4TE 5-PS 6-TB 7-AC 8-10F 11-14JT

Form 2

I Name and Address of Firm________________________________

____

II Job Title____

III Alternative Titles_______________________________________

____

IV Source and Location of Job in Company Dept., Div., etc.__________

____

_ _ _17-19 V _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

_ _20-21 VI Number of workers with title

VII Activities and Duties of Persons with This Job Title

VIIA Working with People Outside Firm

____22 Meeting farm people
____23 Meeting non-farm people
____24 Selling
____25 Advising, consulting and diagnosing
____26 Estimating costs
____27 Buying
____28 Other (specify)____________

Clarification Comments

____
____
____
____
____
____

VIIB Working with Personnel in Firm

____29 Handling men (boss)
____30 Inducting new personnel
____31 Training others
____32 Appraising work of others
____33 Supervising others
____34 Other (specify)

VIIC Working with Production, Products, Materials, or Service

____35 Designing
____36 Making and building
____37 Sketching and drawing
____38 Mixing
____39 Assembling
____40 Inspecting
____41 Testing
____42 Calculating costs
____43 Conducting research
____44 Using technical and service manuals, parts lists
____45 Developing techniques for
____46 Planning production or service
____47 Other (specify)

Clarification Comments

____
____
____
____
____
____

5-FS 6-TB 7-AC 8-10F 11-14JT

VIID Working with Firm's or Customers' Equipment, Tools (hand or power) Supplies and Instruments

____48 Constructing above
____49 Designing
____50 Repairing
____51 Operating
____52 Assembling
____53 Calibrating
____54 Remodeling
____55 Adjusting
____56 Maintaining
____57 Inspecting, Testing, Trouble Shooting
____58 Installing
____59 Selecting
____60 Other (specify)____________

Clarification Comments

____
____
____
____
____
____
____

VIIE Working with Business Problems

____61 Policy-making
____62 Planning
____63 Promoting
____64 Handling money
____65 Keeping records and accounts
____66 Writing articles, copy, etc.
____67 Making speeches
____68 Filing
____69 Inventorying
____70 Making tech. reports
____71 Reading tech. reports
____72 Decision making
____73 Other (specify)____________

Clarification Comments

____
____
____
____
____
____

VIII Areas with Which Worker MUST Be Familiar to Do Job

____17 Soils
____18 Soil and water management
____19 Crops
____20 Horticulture
____21 Floriculture
____22 Livestock
____23 Poultry
____24 Dairy
____25 Feeds
____26 Animal nutrition
____27 Animal Diseases
____28 Plant diseases
____29 Tractors and other power units
____30 Electricity
____31 Farm mechanization
____32 Shop work
____33 Carpentry
____34 Farm buildings
____35 Farm conveniences
____36 Agricultural Economics
____37 General agriculture and rural life knowledge
____38 Agricultural chemicals
____39 Insect and pest control
____40 Forestry
____41 Food processing
____42 Rural recreation
____43 Credit
____44 Insurance
____45 Taxes
____46 Accounting
____47 Business principles
____48 Office procedures
____49 Salesmanship
____50 Chemistry
____51 Physics
____52 Advanced mathematics
____53 Foreign language
____54 Research procedures
____55 Electronics
____56 Mechanics
____57 Sound and light
____58 Hydraulics
____59 Metallurgy
____60 Heat
____61 Architecture
____62 Other (specify)____________

____5-PS ____6-TB ____7-AC ____8-10F ____11-14JT

Clarification Comments

IX Prerequisites of Job

____17 Work experience required
____18 Prior to acceptance of job
____19 On-Job-Training

Clarification Comments

____20 Are there specific policy limitations on ages for employment? If so what?

____21 Education - minimum formal schooling required

1. Less than 4 years
2. Less than 8 years
3. Less than 12 years
4. High school graduate
5. Less than 16 years
6. College graduate or more

X Employment Opportunities

_ _ _ 22-24 Total number of different persons with this job title employed in past five years.

_ _ 25-26 Anticipated additional persons with job title needed in five years (1967) due to growth.

_ _ 27-28 Number of additional people with job title needed in next 12 months due to growth or turnover.

_ _ _ 29-31 Percentage of employees with this job title obtained nearby (within 25 miles).

_ _ _ 32-34 Percentage of employees with this job title obtained from a distance (beyond 25 miles).

Clarification Comments

C

Code

____	____	____	____	____
5-PS	6-TB	7-AC	8-10F	11-14JT

XI SUMMARY DESCRIPTION OF JOB

Job Title____

Description of activities and duties

Description of level of job, interesting characteristics, and miscellaneous comments

____35 Is this a technician level job? Explain why, if not explained above

____36 Is this an agricultural oriented job? Explain why, if not explained above

A STUDY OF OFF-FARM AGRICULTURAL OPPORTUNITIES AND TRAINING NEEDS IN OHIO

During the past several years the need for agricultural education has been questioned by educators and the public. The downward trend in the number of people actually engaged in the production phase of agriculture has caused many to question the need for agricultural education as a part of public education. Since the decrease in the number of farmers has been accompanied by a significant increase in the number of persons engaged in off-the-farm agricultural jobs, the question of the number employed in all phases of agriculture has been seriously debated.

Developments in technology and automation have caused tremendous increases in the number of people needed to service the production phase of agriculture. These people fall into all of the occupational groups such as: professional and technical, proprietors and managers, clerical and sales workers, skilled workers, semi-skilled workers and service workers. Oftentimes, however, those in the field of agriculture have been prone to say that any worker who is working with an agricultural product is an agricultural worker and therefore, needs an education in agriculture. This may be incorrect in that the worker may have very little need for agricultural knowledge and ability even though his job involves the handling of an agricultural product. Therefore, the controversy over what is and what is not an agricultural job goes on.

Need For Study

At the present time there is considerable disagreement concerning the actual number of people who are employed in off-the-farm agricultural jobs. Figures such as 37% or 40% have been used. These figures, however, comprise a great many jobs that require a multiplicity of occupational competencies. Perhaps in many cases a knowledge or awareness of agriculture is important in order for the worker to competently hold the job. However, it may not be essential that he have specific agricultural competencies in terms of: skills, abilities and knowledge relative to technical agriculture. Certainly no one doubts the fact that agriculture today is much more comprehensive than it was 20 years ago. Much more is involved in agriculture than the production of food and fiber which we commonly think of as farming. All of the agricultural service and business job aspects in the agricultural industry have evolved fairly recently. This points up a distinct need to be able to identify those agricultural jobs where knowledge and skill in agriculture is essential for the person to successfully hold the position.

If vocational agriculture is to be better able to meet the educational needs of all persons employed in the agricultural industry it is imperative that it be able to produce carefully validated information concerning the number of off-the-farm employment opportunities for which agricultural competencies are essential. This information could be used as a basis for projecting future needs in terms of the specific educational programs in agriculture that may be needed. The identification of specific agricultural jobs and competencies required is becoming even more important due to the fact that not more than 5% of the available jobs will be of the unskilled variety in the future.

Purpose of the Study

The major purpose of this study is to identify the off-the-farm agricultural jobs and employment opportunities in Ohio. It is hoped that the determination of whether or not the job is agricultural will be based upon whether or not agricultural competencies are essential for success in the job. Some specific objectives are as follows:

1. Identification of off-the-farm agricultural jobs in Ohio.

2. Arrive at a measure of the number of people employed in off-the-farm agriculture.
3. Determine competency levels required to carry out the jobs.
4. Determine future employment opportunities.
5. Identify job characteristics such as:
    a. Salary
    b. Turnover
    c. Fringe benefits
6. Determine the categories of business endeavor in which the greatest number of agricultural jobs may be found.

Background Information

During the early winter of 1963 the State Supervisor of Vocational Agriculture and members of the Teacher Education Staff met with the Dean of the College of Agriculture to discuss the plans for the study. The support of the College of Agriculture and the Ohio Agricultural Experiment Station was requested in the continuation of the study. This support was granted. In addition, the United States Department of Agriculture statistician was available to assist in the study. Following the meeting with the Dean of the College of Agriculture a meeting of approximately 20 key people in the agricultural business organizations of Ohio was called. The outline of the study was presented to them and the outcomes which were hoped for were discussed. This committee substantiated the need for the study and indicated that they would be willing to assist in securing needed information.

Earlier in the preliminary planning stages contact was made with the Director of the Division of Research in the State Department of Education. The Director assisted in giving some suggestions for the procedures to be utilized in conducting the study. The research specialist in this division gave continuous advice concerning the design.

The study is sponsored by the State Department of Education, Vocational Division, Vocational Agriculture Service in cooperation with the Department of Agricultural Education, the College of Agriculture and the Ohio Agricultural Experiment Station. Each of the cooperating agencies volunteered the use of their personnel in designing and conducting the research project.

In discussing the preliminary design for the study it was felt that it would probably utilize the interview technique in securing responses. The information concerning studies of this nature being conducted or having been completed in other states were secured and reviewed as a basis upon which to project the design for this study. However, as further meetings were held with various committees concerning the design of the study a change in method was arrived at.

Design Committee

A special committee of persons from the Department of Agricultural Education, Rural Economics and Sociology, the United States Department of Agriculture met to discuss and suggest design possibilities relative to the study. Those in attendance, in addition to Weiler and Brum, included Smith, Chairman, Department of Rural Ecohomics and Sociology; Bailey; Baumer; Sharp; McCormick; and James Kendall from the U.S.D.A.

These persons were very much interested in the possibilities inherent in this research study. They thought that the answers which we sought would be much needed by agricultural education. As a result of the discussion of this committee it was decided to change the original thinking of the study from that of an interview type to that of a comprehensive questionnaire type using a massive sampling. The research and design experts present at the meeting felt that a questionnaire could be designed to elicit responses which would meet the objectives of the study. They felt that a comprehensive questionnaire should be designed which would include:

1. The kinds of jobs broadly classified by occupational groups.
2. A broad listing of areas of competencies needed.

It was suggested that a massive sampling be secured from a universe consisting of all jobs other than on the farm as designated by the census. In securing the universe it was suggested that we start with the catalog of manufacturers and work through the Division of Taxation and Sales Tax Returns in addition to other sources. In developing the sampling it was suggested that a predetermined number of firms or organizations regardless of whether or not they are considered to be agricultural or nonagricultural should be included. These then could be compared relative to agricultural job opportunities. The questionnaire should be entirely impersonal in that the respondent should not be able to identify kinds of programing or special interest from it. Perhaps the questionnaire would go out under a covering letter from the State Department of Education and written by Dr. Holt, State Supervisor of Public Instruction.

The committee felt that a procedure such as this would permit reliable and unbiased collection of data. It was also felt that if data processing techniques were employed the sampling could be broad enough to give us accuracy within 5% of actual interview or contact. In fact, it was indicated by the statistician that the use of interviews might tend to give a less valid set of data than the mailed questionnaire, this being due to individual differences among the interviewers. The committee indicated that the services of the U.S.D.A. statistical and programing people as well as those from the Department of Rural Economics and Sociology would be available for assistance in developing the questionnaire.

PROCEDURES

General Procedures

As a result of consultation with representative members of the cooperating agencies involved in the study the group agreed that the first step was to identify and develop the universe. In the process of developing a universe contacts were made with the Department of Industrial Relations, Bureau of Unemployment Compensation, the State Chamber of Commerce and the Department of Taxation. The first section of the universe was secured from the Department of Industrial Relations. This is in the form of a listing of all of the manufacturers in Ohio. There are some 14,000 different manufacturers listed by industry and by number of employees in the state. In contact with the Sales Tax Division it was found that it would be possible to secure a population from their files which would include some 200,000 retailers in Ohio. After further consultation with our sampling expert it was decided to select only those retailers who paid a sales tax of $400 or more annually since these would include most of the multiple employee businesses. Therefore, there are 70,000 retailers in this category and the Sales Tax Division is set up so that they can automatically pull any kind of sampling we might decide upon. These two areas make up the largest part of the universe. The parts that are not accounted for include governmental agencies, municipalities, colleges and universities and some services. In further investigation it was found that these additional services could be added by going to the yellow pages.

A contact was made with a person with the Ohio Bell Telephone Company who is with the Federal Communications Commission and his assistance was secured. It was agreed that any of the directories in the state of Ohio we needed could be secured through his efforts.

The universe then consists of three parts. The first part being the directory of Ohio manufacturers, the second part a list of all those who pay sales tax, and the third part, which is a supplementary part, consis of the classified directories of all the phone exchanges in Ohio.

Sampling Procedures

Directory of Ohio Manufacturers by Industry.

Through the cooperation of the Ohio Industrial Commission it was possible to secure a directory of Ohio Manufacturers by Industry for 1962. This directory listed all of the manufacturers in Ohio by categories and alphabetically by name of the firm. The directory made a separate listing of manufacturers by counties. In discussing the list to use for the sampling with Dr. Walker, Associate Professor, Rural Economics, Ohio State University, it was agreed that we would use the listing of manufacturers which was stratified by production areas and which contained a specific listing of manufacturers names alphabetically arranged within each of these areas. The sampling was made by taking every tenth listing provided that the manufacturer employed five or more persons and male employees only. Care was taken so that a respondent was secured from every production area even though there may have been less than ten manufacturers within the production area. This sampling, following the above procedure, gave a total of just about one thousand respondents.

Sales Tax Division

In checking with Mr. Williams, head of the Sales Tax Division of the State of Ohio, it was discovered that through an arrangement between the State Departments, their files would be available for our use. The necessary communication with the Director of the Division of Taxation was made permitting the use of data processing equipment to pull the sample from their files. In checking with the Sales Tax Division the project team discovered that they had 191,946 vendors licenses issued for 1963. In analyzing these it was discovered that those vendors who paid sales tax of less than $400 a year were usually one or two employee firms. Therefore, it was decided to exclude all vendors who paid less than $400 a year in sales tax. This enabled us to reduce the population in this area to 70,000. These 70,000 retail sales establishments in Ohio were grouped by product areas by counties. The county stratification was as follows:

1. Apparel group
2. Automotive group
3. Drug and proprietary stores
4. Eating and drinking places
5. Food group
6. Furniture and fixture group
7. General merchandise group
8. Hardware, machinery, farm equipment, etc.
9. Landscaping and floral group
10. Lumber, building and contractors group
11. Paper and publishing group
12. Professional trades equipment group
13. Specialty stores group
14. Miscellaneous group

In analyzing the available information with Dr. Walker, sampling consultant, it was decided to have the Sales Tax Division pull every ninth vendor from their files utilizing only the ones who had paid more than $400 sales tax per year. Special permission was secured so they could provide us with the name and address of each of these firms.

Yellow Pages of Telephone Directories

In order to secure respondents from areas not covered by either the Directory of Ohio Manufacturers or the Sales Tax Division, it was decided to check with the telephone companies concerning the possibility of securing their classified sections. Mr. Bolander, a consultant for the project, contacted Mr. C. J. Copeland of the Ohio Bell Telephone Company, who in turn furnished us with a complete list of all of the published directories in the state of Ohio. These exchanges included other phone companies in addition to Ohio Bell. In reviewing the list with our sampling consultant it was decided to select 16 different exchanges and secure the yellow page directories from those as a sample. Mr. Copeland was contacted concerning the directories which were needed and the books were secured. This selection included a sampling from cities--three, for example, with a population of 50,000 to 500,000; from about 25,000 to 50,000; 10,000 to 25,000, and rural areas or directories serving less than 10,000.

The yellow pages will be utilized to supplement the two areas of the universe with respondents which have not been covered. Some of these will include governmental and municipal agencies, wholesalers, and some personal service businesses.

Colleges and Universities

After consulting Lewis Stephens, Personnel Director, Ohio State University, it was readily assumed that universities and colleges offered many opportunities for employment such as maintenance men, grounds keepers and like personnel. Therefore, colleges and universities are being included in the group of respondents which number approximately fifty in the State of Ohio.

EMPLOYMENT OPPORTUNITIES AND NEEDED COMPETENCIES FOR WORKERS IN OHIO INDUSTRIES AND BUSINESSES

Firm Name____________________ Address____________________

Principal products and/or services____________________

Name of person making report____________________ Title____________________ Date this report prepared____________________

The purpose of this study is to better train people for employment in Ohio. You will note that the occupations are in groups, numbered 1 through 8. These 8 groups were developed and defined by a national advisory committee on vocational education. There are 3 sections. Qualifications of employees may appear in any or all of the 3 sections. To save time: It is suggested that you list under each of the occupational groups (1-8) total number of employees in each group. Then taking one group at a time check through all 3 sections, entering the number of employees required to have the competencies listed. Definitions of the 8 occupational groups are as follows:

1. Professional:	Occupations which require extensive academic background or a combination of education and experience and a high degree of mental activity.
2. Technical:	Occupations which require post-high school training (2 years) and carry out details of projects conceived by professional and engineering workers plus the "know-how" of skilled craftsmen and operational personnel.
3. Proprietors & Managers:	Occupations that involve policy-making, planning, supervising, guiding work activity of others, usually through intermediate supervisors.
4. Clerical:	Occupations concerned with preparing, transcribing, transferring, filing, and preserving written communications and records.
5. Sales:	Occupations concerned with sale of commodities, investments, real estate, and services, and occupations closely identified with, though not involved in, actual sales transactions.
6. Skilled Workers:	Includes craft and manual occupations requiring thorough knowledge of processes involved in the work, exercise of independent judgment, usually a high degree of manual dexterity, responsibility for valuable product or equipment usually qualified by apprenticeship or extensive training.

7. **Semi-skilled Workers:**	Includes manual occupations requiring dexterity but limited to well-defined work routine; important decisions made by others.
8. **Service Workers:**	Occupations concerned with performing services for others, and maintenance of buildings, grounds, and equipment (but not concerned with adjustment or repairs), stock handling, deliveries, etc.

This section (1) to be answered for present employees. Opposite each major competency enter number of employees required to have this competency for success in your firm.

S E C T I O N I

	1.	2.	3.	4.	5.	6.	7.	8.
	Professional	Technical	Proprietors & Managers	Clerical	Sales	Skilled Workers	Semi-skilled Workers	Service Workers
	Total No. Employed	Total No. Employed	Total No. Employed	Total No. Employed	Total No. Employed	Total No. Employed	Total No. Employed	Total No. Employed
Areas of Competencies	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have
Accounting or quick and accurate at figures								
Advertising								
Credit (granting and collections)								
Financing bank loans, security sales								
Labor Relations								
Management analytical thinker, combining resources, decision making, planning, selecting personnel								
Marketing information & analysis on foods and fiber, industrial products, household products, etc.								

	1. Professional	2. Technical	3. Proprietors & Managers	4. Clerical	5. Sales	6. Skilled Workers	7. Semi-skilled Workers	8. Service Workers
Areas of Competencies	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have
Office Procedure								
Pricing foods & fiber, industrial products, household products, government regulation, labor, etc.								
Public Relations								
Sales promotion, selling and anaylsis								
Supervision								
Other Competencies								
SECTION I (A) **Of the total number of different employees, how many require at least one of the competencies listed in Section I above?**								

	1.	2.	3.	4.	5.	6.	7.	8.
	Professional	Technical	Proprietors & Managers	Clerical	Sales	Skilled Workers	Semi-skilled Workers	Service Workers
Areas of Competencies	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have
	- THE FOLLOWING ITEMS APPLY TO SECTION I (A) TOTALS ONLY -							
Level of education necessary for satisfactory performance:								
Advanced Degree (Master or Ph.D.)								
College (Bachelor Degree)								
High School Plus Technical School (2 years beyond high school)								
Post-High School Vocational (1 year beyond high school)								
High School Including Vocational (12 years)								
High School--General (12 years)								
Wage schedule per week:								
$40-$79								
$80-$99								
$100 +								
Maximum (old employees)								

Areas of Competencies	1. Professional Number Required to Have	2. Technical Number Required to Have	3. Proprietors & Managers Number Required to Have	4. Clerical Number Required to Have	5. Sales Number Required to Have	6. Skilled Workers Number Required to Have	7. Semi-skilled Workers Number Required to Have	8. Service Workers Number Required to Have
Background preferred:								
Farm								
Rural (-2500 pop.)								
Urban or City								
No Preference								
Number of new employees (including replacements) anticipated the next year								

This section (2) to be answered for present employees. Opposite each major competency enter number of employees required to have this competency for success in your firm.

SECTION II

Animal Science including feeds & feeding, breeding, management, etc.								
Insects, diseases, pests, and controls								
Crop production including plant breeding, management, weed control, etc.								
Food processing including dairy products, meats, cereals, fruits, vegetables								

Areas of Competencies	1. Professional Number Required to Have	2. Technical Number Required to Have	3. Proprietors & Managers Number Required to Have	4. Clerical Number Required to Have	5. Sales Number Required to Have	6. Skilled Workers Number Required to Have	7. Semi-skilled Workers Number Required to Have	8. Service Workers Number Required to Have
Soil science including bacteriology, classification, erosion control, fertilization, etc.								
Forestry including propogation, management, timber marketing, etc.								
Horticulture including fruits, vegetables, landscaping, nursery production, maintaining parks and recreation areas								
Agricultural engineering including farm power, machinery, drainage, irrigation, buildings								
Agricultural economics including farm management, credit, marketing, agricultural policy, etc.								
Other Competencies								

Areas of Competencies	1. Professional Number Required to Have	2. Technical Number Required to Have	3. Proprietors & Managers Number Required to Have	4. Clerical Number Required to Have	5. Sales Number Required to Have	6. Skilled Workers Number Required to Have	7. Semi-skilled Workers Number Required to Have	8. Service Workers Number Required to Have
SECTION II (A)								
- Of the total number of different employees how many require at least one of the competencies listed above?								
	- THE FOLLOWING ITEMS APPLY TO SECTION II (A) TOTALS ONLY -							
Level of education necessary for satisfactory performance:								
Advanced Degree (Master or Ph.D.)								
College (Bachelor Degree)								
High School Plus Technical School (2 years beyond high school)								
Post-High School Vocational (1 year beyond high school)								
High School Including Vocational (12 years)								
High School--General (12 years)								

Areas of Competencies	1. Professional	2. Technical	3. Proprietors & Managers	4. Clerical	5. Sales	6. Skilled Workers	7. Semi-skilled Workers	8. Service Workers
	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have
Wage schedule per week:								
$40-$79								
$80-$99								
$100 +								
Maximum (old employees)								
Background preferred:								
Farm								
Rural (-2500 pop.)								
Urban or City								
No Preference								
* * * * * * * * * * * *								
Number of new employees (including replacements) anticipated the next year								

This section (3) is to be answered for present employees. Opposite each major competency enter number of employees required to have this competency for success in your firm.

SECTION III

Chemical Engineering								
Mechanical Engineering								
Civil Engineering								
Electrical Engineering								

	1.	2.	3.	4.	5.	6.	7.	8.
	Professional	Technical	Proprietors & Managers	Clerical	Sales	Skilled Workers	Semi-skilled Workers	Service Workers
Areas of Competencies	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have
Metallurgical Engineering								
Physical Scientists--atomic energy, radiation, electronics, etc.								
Industrial Engineering								
* * * * * * * * * * * * * *								
Auto mechanics								
Carpentry & woodworking								
Chemical technology								
Electrical wiring, appliances and technology								
Food service								
Machinist								
Mechanical technology								
Plumbing and pipe fitting								
Printing								
Sheet metal working								
Welding, combination								
Other competencies								
SECTION III (A) **Of the total number of different employees how many require at least one of the competencies listed above?**								

Areas of Competencies	1. Professional	2. Technical	3. Proprietors & Managers	4. Clerical	5. Sales	6. Skilled Workers	7. Semi-skilled Workers	8. Service Workers
	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have

- THE FOLLOWING ITEMS APPLY TO SECTION III (A) TOTALS ONLY -

Level of education necessary for satisfactory performance:								
Advanced Degree (Master or Ph.D.)								
College (Bachelor Degree)								
High School Plus Technical School (2 years beyond high school)								
Post-High School Vocational (1 year beyond high school)								
High School Including Vocational (12 years)								
High School--General (12 years)								
Wage schedule per week:								
$40-$79								
$80-$99								
$100 +								
Maximum (old employees)								

	1.	2.	3.	4.	5.	6.	7.	8.
	Professional	Technical	Proprietors & Managers	Clerical	Sales	Skilled Workers	Semi-skilled Workers	Service Workers
Areas of Competencies	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have	Number Required to Have
Background preferred:								
Farm								
Rural (-2500 pop.)								
Urban or City								
No Preference								
Number of new employees (including replacements) anticipated within the next year								

The Pennsylvania State University
Department of Agricultural Education
University Park, Pennsylvania

EMPLOYMENT OPPORTUNITIES AND NEEDED COMPETENCIES IN AGRICULTURAL OCCUPATIONS

Date______________________________
Name
of Interviewer__________________________

FORM I

I. Company (firm, organization, agency or service)

A. Name of company____

B. Code of company by number (to identify Form I with Form II)__________

C. Address____________________________ County____________

D. Name of person interviewed__________________________________

E. Telephone number of person interviewed__________________________

F. Position of person interviewed_______________________________

G. Main agricultural products and/or services of company_______________

____

H. Main agricultural function(s) of company (check one or more)

_____ 1. Sales
_____ 2. Services
_____ 3. Purchasing
_____ 4. Manufacturing
_____ 5. Marketing
_____ 6. Processing
_____ 7. Other

I. Years company has been in business_______________________________

J. Percent of gross income that is agriculturally oriented________________

#63-125

II. Employees

A. Total number of employees (including owners)____________________

1. Full-time________________
2. Part-time________________ Number of months________________

B. Employees in company needing competencies in agriculture____________

1. Full-time________________
2. Part-time________________ Number of months________________

	Job Title	Number of Employees	Level of Employment
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

Code for Level of Employment

a. Professional
b. Technical
c. Proprietors and Managers
d. Supervisors and foremen
e. Sales
f. Clerical
g. Skilled
h. Semi-skilled
i. Service (unskilled)

The Pennsylvania State University
Department of Agricultural Education
University Park, Pennsylvania

EMPLOYMENT OPPORTUNITIES AND NEEDED COMPETENCIES IN AGRICULTURAL OCCUPATIONS

FORM II

I. Identification of company, level of employment and job title

A. Code of company by number from Form I, page 1 ____________________

B. Code for level of employment from Form I, page 2 ____________________

C. Job title from Form I, page 2 ____________________

II. Employees needing competencies in agriculture

A. Number of full-time employees ____________________

B. Number of part-time employees ____________________

1. Average number of months employed ____________________

2. If seasonal, list the months ____________________

C. Activities and duties of job title (job analysis)

1.   3.

2.   4.

D. Monthly wage or salary (convert from hourly wage on basis of four 40-hour weeks)

1. Start ____________________   2. Top ____________________

E. Outlook for employment in this job title:

1. Percent annual turnover in the total industry ____________________%

2. Change expected in number employed in the total industry five years from now.

a. Increase ______________% or   b. Decrease ______________%

#63-126

III. Competencies associated with this job title

A. Agricultural Competency Areas

	If needed, check degree of competency					
	To enter			To advance		
	Minimum	Average	High	Minimum	Average	High
1. Plant Science						
a. Plant breeding						
b. Fertilizer						
c. Controlling insects, diseases and weeds						
d. Conservation						
e. Other production practices						
2. Animal Science						
a. Breeding						
b. Nutrition and feeding						
c. Health and sanitation						
d. Housing and equipment						
e. Other production practices						
3. Agricultural business management and marketing						
a. Budgeting, records and analysis						
b. Farm financing (credit, taxes, etc.)						
c. Labor management						
d. Marketing practices						
e. Agricultural policy						
4. Agricultural mechanization						
a. Farm power and machinery						
b. Farm buildings and conveniences						
c. Rural electrification and processing						
d. Soil and water management						
e. Agricultural construction and maintenance						

B. Supporting business and distributive competencies

	If needed, check degree of competency					
	To enter			To advance		
	Minimum	Average	High	Minimum	Average	High
1. Salesmanship						
2. Customer relations						
3. Accounting						
4. Bookkeeping						
5. Buying						
6. Display						
7. Advertising						
8. Financing (capital, credit)						
9. Government regulations (taxes, etc.)						
10. Supervisory training						
11. Management training						
12. Other (specify)						

C. Supporting trade and industrial competencies

1. Electricity						
2. Electronics						
3. Auto mechanics						
4. Plumbing and pipefitting						
5. Machinery operation and repairs						
6. Mechanical drafting and design						
7. Welding						
8. Sheet metal work						
9. Building trades						
10. Industrial chemistry						
11. Transportation						
12. Other (specify)						

IV. Characteristics desired in those who enter and/or advance in the occupation

A. Age________________

B. Educational grade level

______ 1. High school

______ 2. Post high school technical education

______ 3. College degree

______ 4. Doesn't matter

C. Residential background

______ 1. Farm background

______ 2. Rural, non-farm background

______ 3. Urban background

______ 4. No preference

D. Technical short courses

	To enter	To advance
1. Provided by your company	________________	________________
2. Provided by the industry	________________	________________
3. Provided by public schools	________________	________________
4. Provided by an agricultural college	________________	________________

V. Limitations on entering this job title

A. Labor union restrictions

B. Labor laws

C. Licensing or certification

D. Other (specify)